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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/851,191

05/08/2001

Samuel D. Pritchett

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TEXAS INSTRUMENTS INCORPORATED

P O BOX 655474, M/S 3999

DALLAS, TX 75265

EXAMINER

PATHAK, SUDHANSHU C

ART UNIT

PAPER NUMBER

2611

NOTIFICATION DATE

DELIVERY MODE

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ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspto@ti.com

<b>Office Action Summary</b>	<b>Application No.</b> 09/851,191	<b>Applicant(s)</b> PRITCHETT ET AL.	
	<b>Examiner</b> SUDHANSHU C. PATHAK	<b>Art Unit</b> 2611	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 September 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. Claims 1-to-19 are pending in the application.
2. Claims 20-21 have been canceled.

#### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-5, 7, 9 & 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of Troster et al. (An Interpolative Bandpass Converter on a 1.2-um BiCMOS Analog/Digital Array; IEEE Journal of Solid-State Circuits; Vol. 28, No. 4; April 1993; Pages 471-477) and further in view of Williams (5,557,642).

Regarding to Claims 1-5, 7, 9 & 12-18, the Applicant Admitted Prior Art (AAPA) discloses an RF receiver apparatus embodied as an integrated circuit (Fig. 1 & Specification, Page 1, Background of Invention, lines 1-3) comprising a mixing circuitry for mixing an analog RF signal down to an analog IF signal (Specification, Page 3, lines 10-12 & Fig. 1, element 17); an analog IF-to-digital baseband converter, coupled to said mixer for converting said analog IF signal into a digital baseband signal, further comprising an analog-to-digital converter (ADC), a digital IF-to-baseband converter and a matched filter (Fig. 1, elements 12, 14, 15); and an output coupled to said analog IF-to-digital baseband converter for transmitting said

digital baseband signal (Fig. 1, element 18). The AAPA further discloses a baseband processing apparatus (digital signal processor) formed on a second integrated circuit for performing desired digital communications processing coupled to the output of the converter (Fig. 1, elements 13, 16 & Specification, Page 1, Background of Invention, lines 3-6 & Specification, Page 2, lines 1-2). The AAPA also discloses a matched filter (Fig. 1, element 15 & Specification, Page 2, lines 5-13). The AAPA further discloses the matched filter to include a decimator (Specification, Page 2, lines 14-21 & Fig. 2, element 15 & Specification, Page 3, lines 1-18). The AAPA also discloses an example of the digital IF-to-digital baseband converter to include a CORDIC (Coordinate Rotation Digital Computer) circuit (Fig. 2, element 14 & Specification, Page 2, lines 8-13 & Specification, Page 3, lines 1-18). However, the AAPA does not disclose the mixing circuitry and the analog IF-to-digital baseband converter circuitry to be implemented on the same integrated circuit and further does not disclose the ADC having a plurality of sampling frequencies based on the application.

Troster discloses a bandpass analog-to-digital (ADC) converter, implemented on a 1.2um BiCMOS Analog/Digital array, for a cellular radio mobile (systems) receiver (Abstract, Page 471, lines 1-8). Troster also discloses implementing the ADC wherein the input is an analog IF frequency signal and is converted to digital baseband signal (Page 472, Fig. 1 & Page 471, Section II, Converter Architecture, Right-hand column –to-Page 473, Section II, Converter Architecture, Left-hand column). Troster also discloses implementing the converter architecture using

BiCMOS technology used for the fabrication of the mixed array, which has been optimized for high performance analog/digital (mixed signal) applications and further optimized for prototyping of interfaces between high frequency analog signals and complex digital baseband signals (Page 473, Section III, BiCMOS Implementation, Right-hand column). Troster also discloses the a BiCMOS technology for a monolithic implementation on a single integrated circuit of mixed signal circuit components for processing high frequency analog signals and digital baseband signals (Page 475, Fig. 6 & Page 473, Section III, BiCMOS Implementation, Right-hand column & Page 475, Left-hand Column, Section "Floorplan" & Page 476, Left-hand column, Section V, Conclusion). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Troster teaches implementing a BiCMOS technology for the implementation of a mixed signal (analog/digital) circuit components and further implementing a bandpass analog IF-to-digital baseband converter and this can be implemented in the receiver as described in the AAPA so as to provide a monolithic integrated signal path from a high frequency signal to a baseband signal so as to provide high level integration desired for cellular mobile transceivers. However, the AAPA in view of Troster does not disclose the ADC having a plurality of sampling frequencies based on the application.

Williams discloses a receiver comprising an ADC having a plurality of sampling frequencies based on the application (Fig. 3, elements 331, 332, "clk1", "clk2", "bw select" & Column 4, lines 27-38, 59-65 & Column 5, lines 1-7 & Column 6, lines 28-

50). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Williams teaches an ADC having a plurality of sampling frequencies based on the application (protocols) and this is implemented in the RF receiver as described in the AAPA in view of Troster so as to be able to receive a plurality of protocol signals using the same hardware thus increasing the flexibility of the receiver and minimizing components.

5. Claim 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of Troster et al. (An Interpolative Bandpass Converter on a 1.2-um BiCMOS Analog/Digital Array; IEEE Journal of Solid-State Circuits; Vol. 28, No. 4; April 1993; Pages 471-477) further in view Williams (5,557,642) and further view of Patel et al. (6,480,528).

Regarding to Claim 6, the AAPA in view of Troster further in view of Williams discloses an RF receiver apparatus embodied as an integrated circuit comprising a mixing circuit and an analog-to-digital baseband converter wherein the converter further comprises a filter as described above. However, the AAPA in view of Troster further in view of Williams does not disclose the filter further including a quantizer.

Patel discloses a method and receiver for processing a desired signal wherein the desired signal is sampled, processed by a matched filter and then quantized (Abstract, lines 6-9, Column 2, lines 63-65 & Column 3, lines 39-41, 59-67 & Fig. 4-5). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Patel teaches implementing a quantizer for quantizing the

matched filter output and this can be implemented in the RF receiver apparatus as described in the AAPA in view of Troster further in view of Williams so as to provide a predetermined number of bits of resolution of the data, thus satisfying the limitation of the claim.

6. Claims 8, 10-11 & 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of Troster et al. (An Interpolative Bandpass Converter on a 1.2-um BiCMOS Analog/Digital Array; IEEE Journal of Solid-State Circuits; Vol. 28, No. 4; April 1993; Pages 471-477) further in view Williams (5,557,642) and further view of Fukuda et al. (4,665,532). Regarding to Claims 8, 10-11 & 19, AAPA in view of Troster further in view Williams discloses a RF receiver apparatus comprising a mixing circuitry, an analog IF-to-digital baseband signal converter and a baseband processing apparatus physically separate from the RF receiver apparatus as described above. However, AAPA in view of Troster does not disclose the analog IF-to-digital baseband converter to include a parallel-to-serial converter connected between said analog IF-to-digital baseband converter and said output, said parallel-to-serial converter providing serial formatted.

Fukuda discloses a parallel-to-serial converter for converting data in a parallel format (I & Q) into a serial format after demodulation of the received signal so as to recover the transmitted data in the desired (serial) format (Fig. 2, element 210 & Column 3, lines 29-42 & Column 4, lines 20-35). Fukuda further discloses a clock implemented in a parallel-to-serial converter and a serial-to-parallel converter (Fig. 5,

element "CLK"). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Fukuda teaches a parallel-to-serial converter, and this can be implemented in the receiver as described in AAPA in view of Troster further in view Williams so as to provide a serial data stream received as transmitted by the transmitter, thus satisfying the limitation of the claim. Furthermore, the conversion of the received serial data, in the baseband apparatus, and converting the data to parallel format is a matter of design choice depending on the application and format of the data transmitted from the transmitter.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, it is recommended to the applicant to amend all the claims so as to be patentable over the cited prior art of record. A detailed list of pertinent references is included with this Office Action (See Attached "Notice of References Cited" (PTO-892)).
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SUDHANSHU C. PATHAK whose telephone number is (571)272-5509. The examiner can normally be reached on 9am-5pm.  
  
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on 571-272-3042.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 2611

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sudhanshu C Pathak/  
Primary Examiner, Art Unit 2611